WHAT IS CLAIMED IS:

1. A process for separating difluoromethane (HFC-32) from at least one halocarbon of a first mixture comprising difluoromethane (HFC-32) and halocarbon selected from the group consisting of chlorodifluoromethane (CFC-12), 1,1,1-trifluoroethane (HFC-143a), chloropentafluoroethane (CFC-115), and pentafluoroethane (HFC-125), comprising the steps of:

contacting the first mixture with an extractive agent selected from the group consisting of:

hydrocarbon extractive agents comprising hydrocarbons having from 5 to 9 carbon atoms and having a normal boiling point greater than about 30°C and less than about 155°C,

oxygen-containing extractive agents comprising alcohols having a normal boiling point greater than about 60°C and less than about 100°C and represented by the formula $C_xH_{2x+1}OH$, wherein x is from 1 to 3, and ketones having a normal boiling point greater than about 50°C and less than about 110°C and represented by the formula $C_yH_{2y+1}COC_zH_{2z+1}$, wherein y and z are 1 or greater and y+z is at most 5, and

chlorocarbon extractive agents comprising chlorocarbons having a normal boiling point greater than about 39°C and less than about 150°C and represented by the formula $C_sH_{2s+2-t}Cl_t$, wherein s is 1 or 2 and t is from 2 to 4 to form a second mixture,

separating difluoromethane (HFC-32) from at least one halocarbon of the second mixture by extractively distilling the second mixture, and

recovering difluoromethane (HFC-32) substantially free of at least one halocarbon, with the proviso that when the halocarbon is pentafluoroethane (HFC-125), the chlorocarbon extractive agent may not be methylene chloride.

2. The process of Claim 1 wherein the hydrocarbon extractive agent is selected from the group consisting of hydrocarbons having 5 to 7 carbon atoms and having a normal boiling point greater than about 30°C and less than about 110 °C.

3. The process of Claim 2 wherein the hydrocarbon extractive agent is selected from the group consisting of n-pentane, 2-methylpentane, 3-methylpentane, cyclopentane, methylcyclopentane, n-hexane, cyclohexane and n-heptane.

4. The process of Claim 1 wherein the oxygen-containing extractive agent is selected from the group consisting of methanol, ethanol, propanol, iso-propanol, propanone, and butanone.

5. The process of Claim 1 wherein the chlorocarbon extractive agent is methylene chloride.

6. The process of Claim 1 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 50 ppmw halocarbon.

7. The process of Claim 1 wherein the difluoromethane (HFC-32) recovered from the second mixture contains less than about 0.1 ppmw halocarbon.

8. The process of Claim 1 further comprising recycling at least a portion of the extractive agent obtained from the extractive distillation of said separation step for use in preparation of the second mixture of said contacting step.

9. The process of Claim 1 wherein the extractive distillation is performed at a pressure from about 15 to 350 psia.

10. The process of Claim 1 wherein the extractive distillation is performed using a reflux ratio of from about 1/1 to about 10/1.

11. The process of Claim 1 wherein the difluoromethane (HFC-32) and halocarbon of the first mixture are an azeotropic composition.